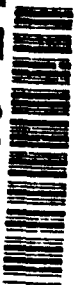


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The Air Attack Division: AirLand Battle
Future's Operational Contingency Force?

A Monograph
by

Major Edward J. Sinclair
Aviation

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ABSTRACT

THE AIR ATTACK DIVISION: AIRLAND BATTLE FUTURE'S OPERATIONAL CONTINGENCY FORCE? by Major Edward J. Sinclair, USA, 58 pages.

This monograph examines the feasibility of utilizing the proposed Air Attack Division as an operational contingency force. In the future U.S. Army forces may have to rapidly respond to a variety of contingencies anywhere in the world. Currently the Army maintains various types of contingency forces to include airborne, light infantry, air assault, and mechanized divisions. Identification of the strengths and weaknesses of each type organization aids in determining the shortfalls of today's contingency forces. The proposed Air Attack Division offers a complement which may fill the identified shortfalls.

A comparison of the proposed Air Attack Division to today's contingency forces provides a basis for analysis. Each organization is evaluated against the criteria of threat/terrain, deployability, combat power, and sustainability. After a detailed critical analysis, conclusions are drawn and appropriate recommendations made concerning the feasibility of utilizing the proposed Air Attack Division as an operational contingency force.

This monograph concludes that the proposed Air Attack Division, assuming approval of the force structure, can effectively operate as an operational contingency force. The proposed Air Attack Division provides a broader spectrum of applicability and flexibility than the other contingency forces examined. Its great mobility and firepower enable it to defeat any foe throughout the spectrum of conflict. Centralization of the diverse weapons systems in an Air Attack Division under one headquarters increases combat effectiveness and eases the synchronization of maneuver. The addition of ground maneuver forces, air assault infantry and light armor, and direct support MLRS enhances the division's effectiveness when and where environmental conditions are not always favorable to aviation operations. The U.S. Army stands at the threshold of a unique opportunity to develop new concepts of future warfare and contingency operations. The Air Attack Division capitalizing on its inherent versatility, lethality, and deployability will play an important role.

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I. Introduction.

The Army of the future will have to be versatile, deployable, and lethal. In view of the rapidly changing international environment, the precise time, location, and nature of the threat will always be uncertain. Consequently, the exact composition of the Army element needed to overcome any specific threat will best be determined on a case-by-case basis.¹

The AirLand Battle Future (ALBF) concept focuses on the employment of the Army as the land component of the U.S. military power in the early part of the 21st century. The evolutionary development of the ALBF concept builds upon current AirLand Battle doctrine and describes the capabilities the Army will need to conduct joint and combined combat and noncombat operations to support the future national security strategy. Based on current and projected threats to our national interests, the key to the Army fulfilling its future role centers on "versatile, balanced, and modern forces optimized and tailorable for the missions they are expected to undertake."²

The AirLand Battle Future concept states the requirement for five types of Army forces in the future: (1) forward deployed, (2) contingency, (3) reinforcing, (4) nation development, and (5) unique mission.³ Regions which are more important to our national interests will still require forward deployed forces in enough strength to deter regional threats and demonstrate our resolve. However, as forward deployed forces are reduced contingency forces will be used to intervene worldwide to influence or change regional power balances, to shape decisions, and to control crises in parts of the world where U.S. forces are not deployed. These contingency forces must provide the "shock effect" necessary to gain the initiative and allow time for negotiations or for further U.S. military build-up.⁴ As the

world becomes more unpredictable and volatile, contingency forces must be versatile enough to respond to different types and sizes of threat. The Army must be able to tailor forces for tactical and operational superiority over any opponent. This study analyzes the proposed Air Attack Division in contingency operations. Specifically, does an Air Attack Division provide the necessary capabilities to complement future contingency force requirements under the AirLand Battle Future concept?

The ALBF concept links projected national interests with future Army force capabilities, assumes that a Soviet invasion of Europe no longer poses the major threat, and that the Soviets are realigning their forces in a more defensive orientation because of domestic policies. The perceived change in the Soviet threat may lead to sharp reductions of forward-deployed U.S. Army units in Europe. However, the potential for other conflicts continues to grow. The deterioration of Soviet influence among its former satellite countries and reduction of the fear that regional conflicts may escalate into superpower confrontations creates instability. The insecurity of world relations, coupled with budgetary problems within our own government, requires a reevaluation of how the Army will fight future conflicts. ALBF provides a concept enabling the U.S. to capture the benefits of advanced technology while at the same time accommodating the changing threat and complying with evolving fiscal and political constraints.⁵ Global-oriented contingency operations become the primary focus of the Army. This newly prioritized contingency mission focus requires equipment, organizations, and doctrine quite different from the European-oriented Army of the past forty-five years.

In order to respond to the increased number of threats to U.S. interests worldwide, the National Command Authority (NCA) may direct contingency

operations of U.S. forces in support of national policy. "Contingencies are crisis situations, often with complex political ramifications, involving imminent or actual military conflict at the low- to mid-range of the intensity scale. These crises present a definite threat to U.S. interests; but the situation, military mission, and military threat are often vague and uncertain."⁶ In protecting U.S. interests, contingency operations require the rapid insertion of combat units that can place the enemy operations at risk. These forces may be deployed before or after fighting starts, but in either case must have sufficient combat power to make a significant impact. They must be tailorable based on the METT-T analysis (Mission, Enemy, Terrain, Troops available-Time) and rapidly deployable by Air Force or Navy assets. Contingency operations may infer deployment into an area with no sustaining base. Therefore, forces employed for these missions must be capable of providing their own support since host nation support in many cases cannot be guaranteed. In short, future contingency forces must be sustainable as well as "versatile, deployable, and lethal" as described by General Vuono.

In his October 1987 "Army Greenbook" article, the Chief of Staff of the Army highlighted the importance of planning for the future. He stated that "our duty to 'shape the Army of the future' is just as important as maintaining today's readiness and it needs even more the guiding focus of a vision."⁷ If we are to have an effective Army that can fight across the entire spectrum of contingency operations anywhere in the world, planning future force structures is imperative. In addition to currently existing contingency forces, authors of the ALBF concept have tailored several organizational models that they believe meet the requirements of future contingency operations. As fiscal constraints impose limitations on

the military, the Army cannot afford the luxury of numerous contingency organizations, each responsible for a specific type of threat. The Army must develop the best possible organizations to execute the entire spectrum of contingency operations while remaining within its means. Does the proposed Air Attack Division provide the necessary capabilities to complement future contingency force requirements under the AirLand Battle Future concept? Answering this question requires an analysis of a broad body of knowledge to include current doctrine, books, ALBF Case Studies conducted by the Combined Arms Combat Developments Activity at Fort Leavenworth, data from the Army Aviation Center's Concept Developments Branch at Fort Rucker, previous theses, and interviews with selected senior officers in the Army.

This study uses a four part methodology to analyze organizational models for contingency operations and determine if the proposed Air Attack Division does provide the necessary capabilities to complement future contingency force requirements in an AirLand Battle Future scenario. Step 1 determines the requirements of contingency forces capable of responding to global threats as envisioned by the ALBF concept. Step 2 provides a brief summary of the various types of contingency forces to include airborne, light infantry, air assault, and mechanized divisions. Step 2 also identifies the strengths and weaknesses of each type organization thus aiding in determining whether or not shortfalls exist in today's contingency forces. Finally, Step 2 examines the Air Attack Division as a suggested complement which may fill the identified shortfalls. Step 3 compares the Air Attack Division to today's contingency forces and evaluate each against the criteria of threat/terrain, deployability, combat power, and sustainability. Step 4 draws conclusions from the analysis and makes appropriate recommenda-

tions . Integration of the results establishes the feasibility of utilizing the proposed Air Attack Division as an operational contingency force. Additionally, this step notes the implications to the further development of the AirLand Battle Future concept and Army force structure .

II. Requirements of Future Contingency Forces.

The Evolution of the Army Using Insights for AirLand Battle Future lists several planning considerations for contingency operations.⁸ After careful analysis, it becomes clear that the ALBF authors omitted several essential requirements. Figure 1 depicts a collective effort of the ALBF authors and other identified requirements necessary for future contingency forces.

Figure 1 - Critical Capabilities for Future Contingency Forces

- Detailed Intelligence Preparation of the Battlefield emphasizing Composition of Threat Forces and Terrain Appreciation
- Rapidly Tailorable and Deployable Forces
- Sufficient Relative Combat Power to Ensure Friendly Forces Possess the Necessary "Shock Effect" with Lethality and Mobility to Immediately Gain the Initiative
- Integral Ability for Self-Sustainment

Numerous other requirements for future contingency forces may exist, however, the four listed capabilities appear as the most important. Therefore, this study centers on only the four considerations listed. First,

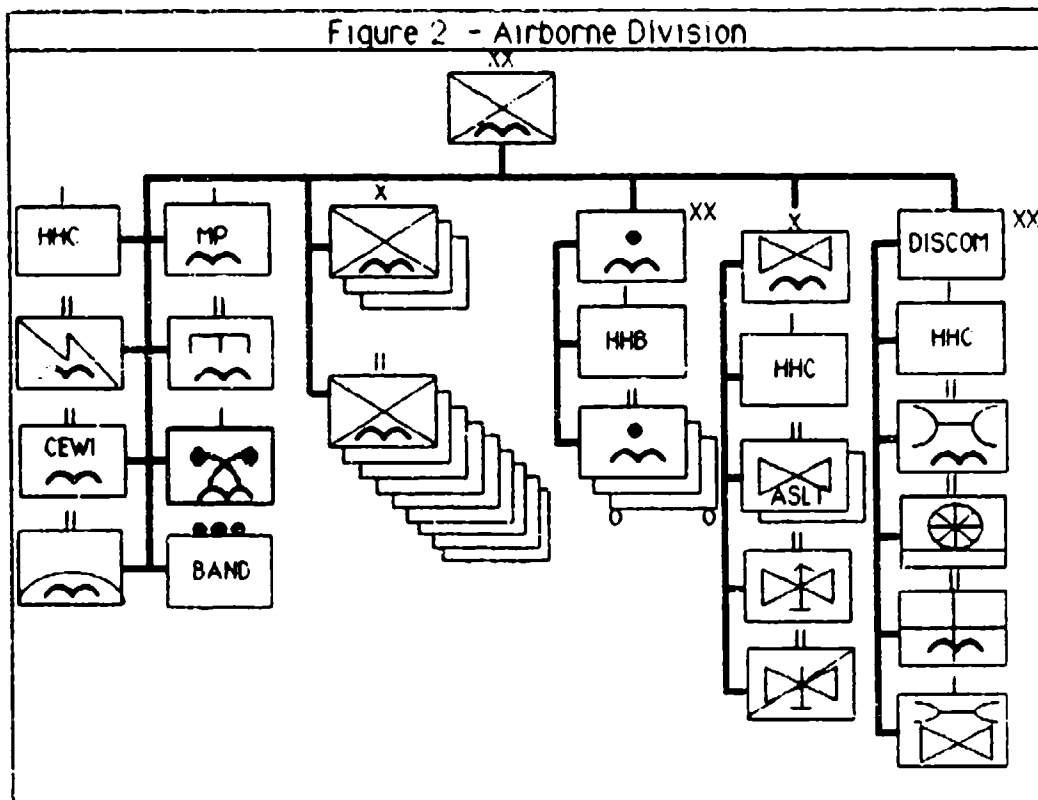
units must be capable of conducting a detailed Intelligence Preparation of the Battlefield (IPB) to analyze the possible threats and terrains that the contingency force may face. Second, organizations must be flexible enough so the contingency force commander can rapidly tailor forces for any situation based on the enemy threat and terrain considerations. Additionally, the force must deploy on limited assets and in minimum time. Third, future contingency forces must possess adequate combat power relative the enemy to deter him from hostile actions or, if deterrence fails, rapidly seize the initiative from him and set the conditions for victory. Last, the force must possess sustainment capabilities that support the overall mission accomplishment. Each of these characteristics possesses a varying degree of importance but all add an integral segment to a successful contingency force.

III. Presently Available Contingency Forces.

Six types of contingency forces currently exist that allow the U.S. to respond to the entire spectrum of conflicts. Each has its own strengths and weaknesses. Two of the contingency forces, the Ranger Regiment and Special Forces Groups, will not receive detailed analysis because of their limited numbers and scope of operations. Before progressing into the study, a brief review of the other four contingency forces aids in the critical analysis.

A. Airborne Division.

The airborne division provides the Army with a strategic, rapidly deployable, combined arms, forced entry capable force.⁹ It can achieve tactical and strategic surprise by its clandestine arrival on the battlefield. The range of aircraft and the adverse weather aerial delivery system (AWADS) deliver the division into virtually any objective area worldwide and under adverse weather conditions.¹⁰ Even in situations not requiring forced entry, the airborne division may parachute into objective areas for the psychological impact on the enemy. In addition, airdropping the division allows insertion of the initial assault force more quickly than any other means available. Follow-on forces usually airland since this method transports more personnel and equipment per airlift assets used.



Once on the ground, the the airborne division possesses unique capabilities. Organized as depicted in Figure 2¹¹, the airborne division fights as a combined arms team integrating the battlefield operating systems. Nine airborne infantry battalions make this division ideal for opposing light enemy forces. Its organic attack helicopter battalion and ground antitank systems provide increased firepower against enemy armor forces.

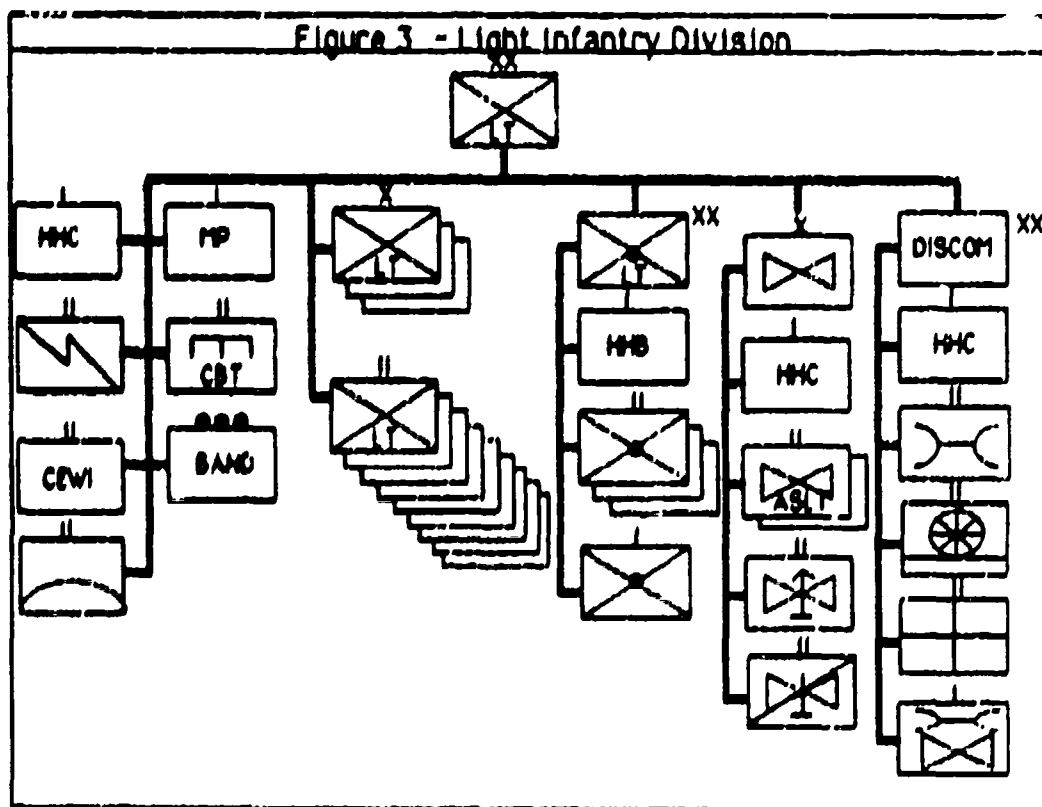
Several limitations influence the employment of an airborne division. It relies on Air Force tactical and strategic airlift assets to get to the objective area. Once on the ground, the division relies on fragile air lines of communications until linkup with other ground forces occurs. The division has very limited organic ground or air mobility. The air assault battalion of the aviation brigade can only lift one infantry battalion at a time. If opposing an enemy force consisting of heavy or even light-heavy forces, special precautions exist. Even though the division does have a substantial number of antitank weapons, it does not possess enough firepower or maneuverability to take on enemy armor formations except in very restricted terrain favoring light infantry type forces.. The division requires increased close air support when fighting enemy armor forces. It must also receive augmentation of medium artillery. This provides the maneuver battalions with increased indirect fire support as well as providing a means of effectively suppressing enemy air defenses.

The unique capabilities of the airborne division make it a prime player in contingency operations. Its highly lethal, no-notice, fast-deploying, forced-entry capability has enormous utility in any contingency operations. It has proven itself in numerous contingency operations over the past thirty years in both low- and mid-intensity operations.

B. Light Infantry Division

In the early 1980's the Chief of Staff of the Army, General Wickham, directed the development of "a credible, capable, sustainable, deployable, and affordable light infantry force."¹² This became the first step in improving the Army's strategic flexibility and deterrent capability. He identified specific design criteria for the new force structure.¹³ First, the light infantry division strength would not exceed 10,000 soldiers of which approximately 50% would consist of infantrymen. Second, employment of the division was envisioned primarily at the lower end of the conflict spectrum in contingency missions; however, it must retain utility for employment at higher conflict levels expected in Central Europe. Third, the division must be deployable in 500 C-141 sorties or less.

The light infantry division, built around a core of "Light Fighters" highly trained to conduct light infantry warfare, provides the Army with a light combined arms force of maneuver, combat support, and combat service support units. Its inherent light infantry characteristics make it most effective when employed in terrain favoring dismounted operations, such as jungles, mountains, or urban areas. However, in favorable terrain, with the right mission, and when augmented with additional forces, the light infantry division can effectively fight heavy forces. The light infantry division, organized as depicted in Figure 3¹⁴, enters the objective area by various means of strategic and tactical transportation, either by air or sea. Strategic movement of the division compares favorably to the other types of contingency forces because of the lack of large, bulky vehicles. Once on the ground, the division can operate for 72 hours without external support.¹⁵



Numerous weaknesses result from such an austere organization as a light infantry division ¹⁶. The division lacks rapid tactical mobility. Even though the aviation brigade has two organic air assault battalions, the division can move only two infantry battalions simultaneously. The lack of mobility increases the division's reaction time, thereby limiting battlefield maneuverability. In certain types of terrain, enemy mechanized forces may be able to apply decisive combat power before a light infantry division can concentrate its forces. Therefore, the division must carefully analyze its missions to ensure it operates on terrain that will lessen the mobility differential. The divisional artillery parallels the infantry units in its lack of mobility and firepower. While able to move by air and set up quickly, the 105mm artillery does not provide the heavy firepower to counter many

threats. Due to the limited organic air defense systems, the division requires local air superiority when deployed. The division's air defense battalion fires only Stingers and Vulcans limiting its effectiveness.

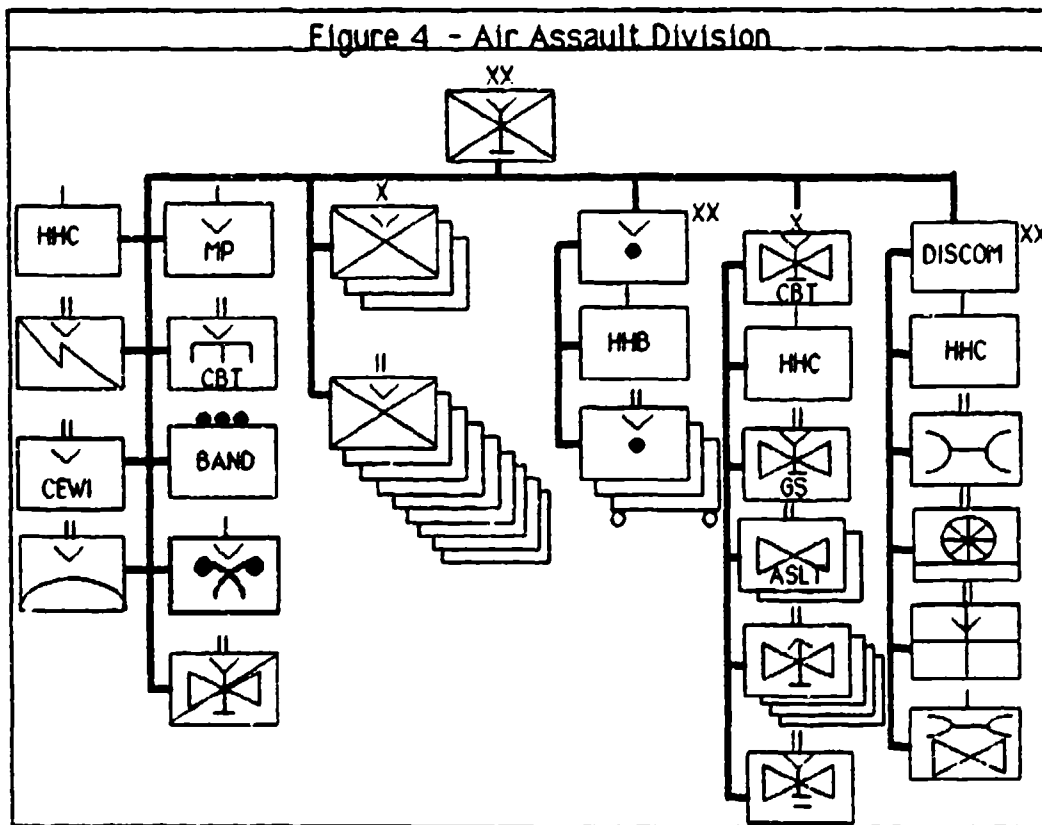
The light infantry division sacrifices firepower and mobility at the expense of rapid strategic mobility. It has proven a viable contingency force when opposing light enemy forces. Conditions must favor dismounted operations for the light infantry division to oppose heavier enemy forces. The division will have to rely on the "Light Fighter" spirit to overcome many challenging situations when opposing heavier enemy forces.

C. Air Assault Division.

The Air Assault Division provides the Army with a light, highly mobile force that relies on helicopter support, to move about the battlefield.¹⁷ The strength of the division, as depicted in Figure 4¹⁸, centers on the habitual relationship and integration of infantry and Army aviation. Aviation integration throughout combat operations allows for self-deployment of the division and continuous sustainment of fighting forces. This operational relationship allows the division to move considerable distances, rapidly concentrate forces at the critical time and place, then quickly disperse for employment in a different area of the battlefield if needed.

The air assault division possesses many unique capabilities because of its extensive use of helicopters for movement. The division avoids many terrain obstacles and can achieve tactical surprise. The air assault division also possesses more antitank weapons than any of the other contingency forces examined. As a result, the division can defend against heavier foes for a limited time period. The aviation brigade of the division provides the key to successful operations. The brigade consists of eight battalions

performing command and control, reconnaissance, combat lift, medium assault lift, and attack functions. The four attack helicopters provide a significant antitank force. The air assault division can conduct strategic movement to a secure staging area near an objective area and then self-deploy into the area of operations to conduct combat missions.



The air assault division's reliance on helicopters brings with it inherent vulnerabilities.¹⁹ Adverse weather, extreme heat and cold, and other environmental conditions, such as blowing snow and sand, limit flight operations thus influencing the division's operations. Battlefield obscurity also degrades helicopter operations. Availability of suitable landing zones and pickup zones greatly influence the tactical scheme of

maneuver. The division relies on air lines of communication for resupply. These can be easily interdicted if the enemy has an integrated air defense network. Due to the large number of helicopters in this organization the aviation fuel requirements are enormous.

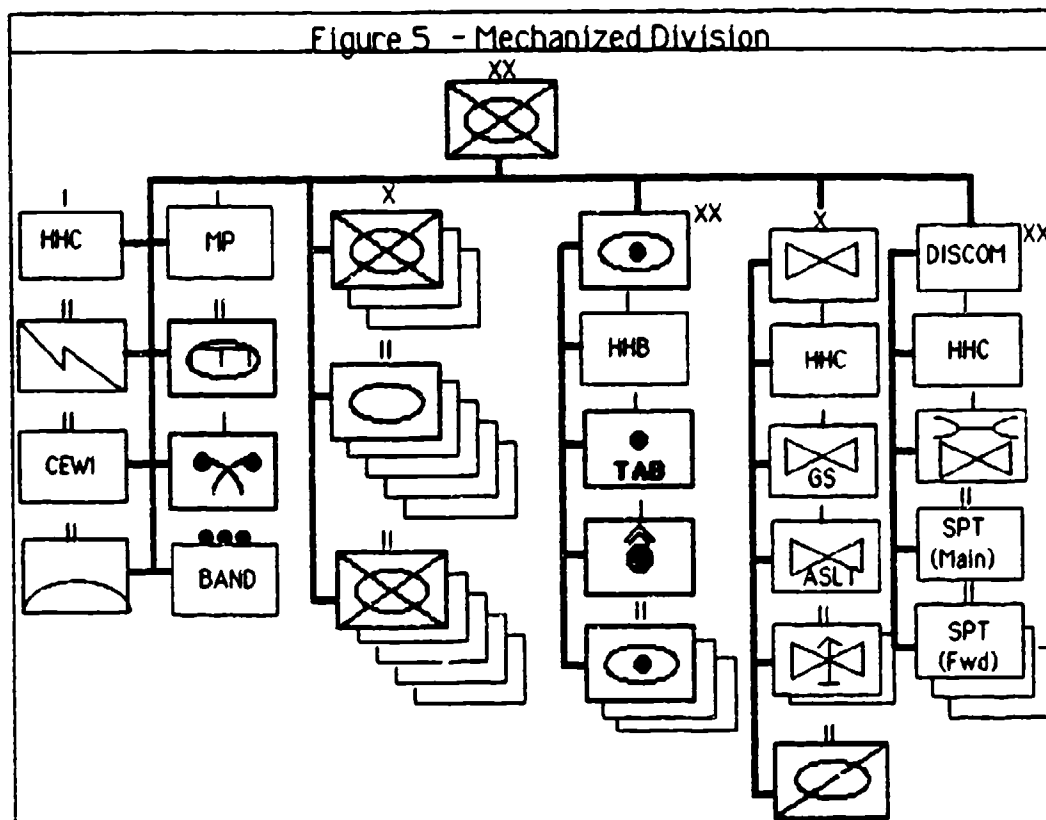
While providing the commander with unique maneuverability and firepower capabilities, the air assault division brings with it many limiting planning considerations. Its diverse organizational structure allow it to oppose the entire spectrum of enemy forces from light infantry to armor formations, but adverse weather can halt the entire operation of the division. As technological advances in aircraft occur, the significance of the air assault division as a contingency force will increase.

D. Mechanized Division.

The mission of a mechanized division is "to close with and destroy the enemy by firepower, mobility, and shock effect."²⁰ Fighting as a combined arms team, the mechanized division's mobility, armor protection, and lethal firepower contribute to the shock action required to defeat threat forces. Normally associated with the high intensity European battlefield, the mechanized division can provide a viable contingency force in certain cases when significant combat power overrides rapid response. Recent events in DESERT STORM have proven the value of a mechanized division in contingency operations.

The mechanized division, as depicted in Figure 5²¹, provides a commander with capabilities not possessed by the other contingency forces.²² The division can conduct sustained, mobile combat operations against heavy enemy forces in conventional, chemical, or nuclear environments. The night fighting capabilities of the division far exceed those of any foe. These

capabilities become increasingly important as modern weaponry and weapons of mass destruction are proliferated throughout the world. The division can disperse over great areas and then rapidly concentrate from separated locations to decisively engage the enemy. The mechanized division can also conduct security operations for a corps size element allowing time for the remainder of the follow-on forces to arrive in the objective area.



The size of a mechanized division presents a major limitation of using this force for contingency operations.²³ Strategic mobility by air is limited because of the substantial quantities of heavy equipment assigned. Use of sealift greatly extends the response time to any objective area. Reliance on

heavy vehicles restricts the division's mobility in jungles, dense forests, steppe and rugged terrain, built-up areas, and around water obstacle. The division also has logistical constraints. The heavy vehicles that give the division its significant combat power also consume extremely high amounts of supplies, especially Classes III and V, when compared to other contingency forces. The support required to maintain and service the large quantity of vehicles also presents several problems such as transporting repair parts, fixing complex combat systems, and manning the systems.

DESERT STORM provides a vivid example of the effective use of a mechanized division as a contingency force. Clearly, a mechanized division can conduct contingency operations only under certain situations when the need for a timely response does not exist. If given the time, a mechanized division can provide an extremely powerful contingency force.

E. Identified Shortfalls.

Each of the force structures analyzed possesses strengths and limitations for use as contingency forces. Airborne, light infantry, air assault, and mechanized divisions provide the United States with a varied capability to respond to any important contingency. Their varying capabilities may make one more effective than the others in a specific scenario. Most of the organizations can respond to a specific threat. None of the organizations can provide a force capable of responding to the multitude of threats and varying locations throughout the world. Figure 6 provides a summary of the identified strengths and weaknesses of each organization based on the criteria presented.

Figure 6 - Identified Shortfalls of Contingency Forces				
	Threat/ Terrain	Deployability	Combat Power	Sustainability
Airborne Division	FAIR best against light forces and in restrict- ed terrain	EXCELLENT rapid response forced entry capability	GOOD needs augment- ation against heavy forces	EXCELLENT for limited period until linkup with friendly forces
Light Infantry Division	FAIR best against light forces and in restrict- ed terrain	GOOD (+) rapid response but must have secure landing sites	FAIR needs augment- ation against heavy forces	EXCELLENT for limited period until linkup with friendly forces
Air Assault Division	GOOD Can oppose en- tire spectrum of enemy, any terrain, effect of weather	FAIR requirement to transport large numbers of helicopters	GOOD significant at- tack helicopter and airmobile forces	GOOD requires large amounts of aviation fuel
Mechanized Division	FAIR best against heavy forces in open areas, poor in re- stricted areas	POOR needs large amount of sea- lift, slow response time	EXCELLENT extremely ef- fective com- bined arms team	FAIR requires large amounts of CL III and V, sig- nificant maint- enance effort

A detailed analysis of Figure 6 shows that the Army clearly lacks an organization capable of responding to the entire spectrum of expected future contingency operations. An airborne division has excellent deployability and can self-sustain for limited periods of time. It provides an excellent force to counter light enemy forces and operates best in restricted terrain where it can maximize its inherent advantages. However, an airborne division lacks the necessary combat power to oppose heavy enemy forces as displayed in recent events in the Middle East. While providing a valid deterrent force against Iraq in the early stage of DESERT SHIELD, the airborne division would have provided no match against the Iraqi

armor forces had Saddam Hussein continued the Iraqi attack south into Saudi Arabia.

A light infantry division possesses many of the same characteristics of an airborne division. The deployability and sustainability characteristics of an airborne and a light infantry division compare very closely. A major difference in deployability, however, requires a secure landing location for the light infantry division while an airborne division can make a forced entry. The light infantry division also operates best against light enemy forces and in restricted terrain. It possesses even less combat power than an airborne division and must receive significant augmentation to fight heavy enemy forces. The utilization of the light infantry division has been a topic of debate in military circles since its inception in the early 1980's. A debate centers around the division's capabilities. The main concern is that, although the division could deploy more quickly than any other type of unit, it did not have the mobility, firepower, or survivability to withstand close combat.

The air assault division's improved strategic mobility -- coupled with its unequaled day and night tactical mobility, highly flexible artillery and attack helicopter fires, and diverse maneuver systems -- make it ideal for many different contingency scenarios. It requires significant strategic airlift or sealift assets because of the large amount of space required to transport large numbers of cumbersome helicopters. Deployment of the helicopters also requires considerable time because of the need to disassemble portions of the aircraft for transport. Once deployed to the contingency area, the air assault division possesses great operational mobility and increased firepower. Its helicopters and infantrymen allow it to oppose the entire spectrum of threats in any type of terrain. The reliance

on helicopters also creates sustainment challenges due to the large amounts of supplies, especially aviation fuel, required to operate the division.

Despite the criticality of the units already analyzed in the early stages of any contingency operation, mechanized infantry and armor forces will always be required against an enemy with significant armor forces. Deployability and sustainability of a mechanized division provide monumental challenges. A heavy division requires deployment by seallift, which consumes much more time than the other contingency forces require to move by airlift. Even though slow to deploy, once on the ground the mechanized division possesses the combat power to determine the outcome of an operation. A mechanized division also presents many sustainment challenges, especially resupplying Classes III and V. DESERT SHIELD and DESERT STORM demonstrated that these challenges can be overcome and that mechanized forces can and will play a vital role in future contingency operations.

In summary, Figure 6 shows that the Army lacks an organization capable of responding to the entire spectrum of expected future contingency operations. A shortfall currently exists in balancing strategic deployability and tactical combat power. Today's organizations fall into two categories. They can either deploy rapidly but with reduced combat power or they deploy slowly but with significant combat power. A contingency force commander must mix and match different types of available forces to accomplish the mission. As fiscal constraints impose limitations on the military, the Army cannot afford the luxury of maintaining a different type organization for each type of threat. The Army must develop the best possible organizations to execute expected future contingency operations while remaining within

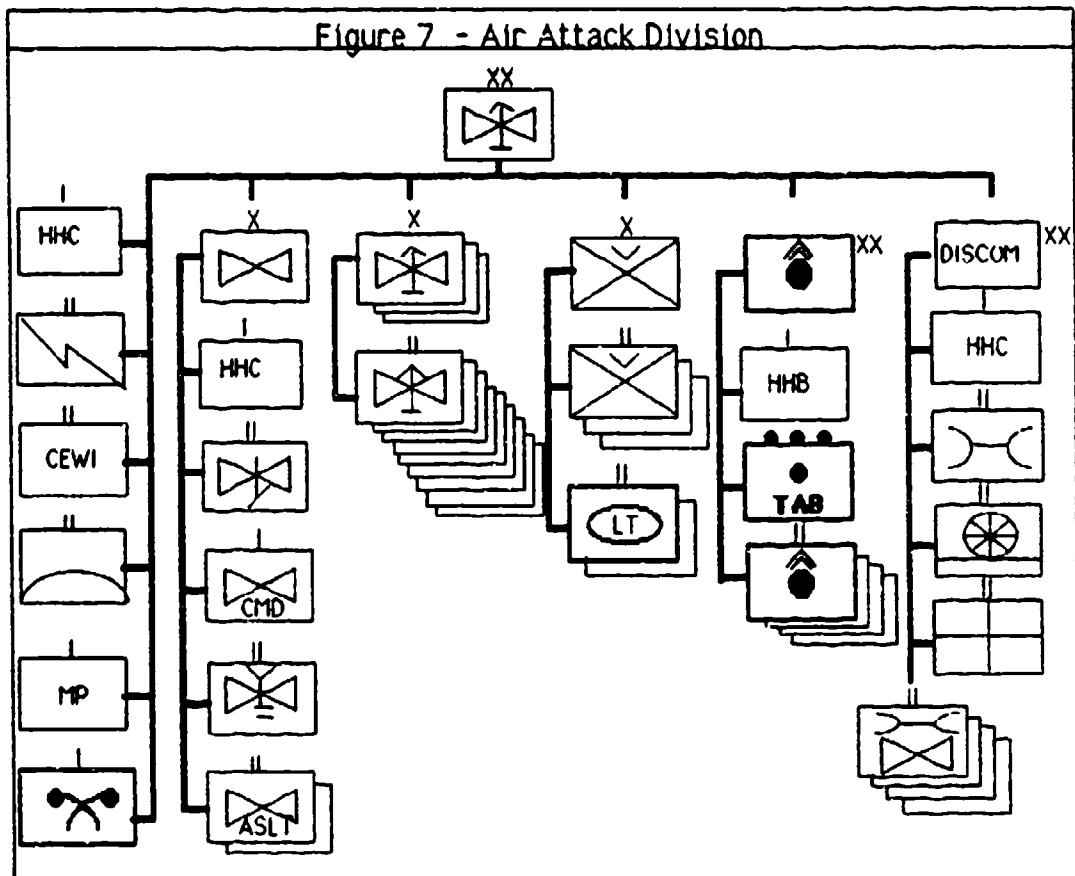
our means. The need exists for a force structure allowing the commander a balance between strategic mobility and tactical combat power.

E. The Air Attack Division as an Alternative.

The concept of consolidating Army aviation assets, especially attack helicopters, at corps level first appeared in the AirLand Battle Future: Alternate Case Study (Phase I) in February 1990.²⁴ This proposal only considered the consolidation of aviation assets of a heavy corps. Based on guidance from Major General Rudolph Ostovich, the Concepts Development Branch at the U.S. Army Aviation Center at Fort Rucker, Alabama further refined the proposed force structure into an air attack division.²⁵ The air attack division would provide the Army with a highly mobile and lethal combined arms team maximizing the inherent capabilities of attack helicopters.

The proposed air attack division would provide a full range of maneuver, CS, and CSS support to conduct contingency operations. The proposed division would consist of three heavy attack helicopter brigades, an air assault brigade, a general support brigade, a division artillery, and a division support command.²⁶ A robust staff in each of the attack brigades would enable them to execute missions as part of the air attack division, as an independent brigade, or as a support element by placing them OPCON to a ground maneuver division. The general support brigade would remain unchanged from the current aviation group of a corps brigade. The air assault brigade, composed of three air assault battalions and two light armor battalions, would provide the division with an all-weather, 24 hour capability. The division artillery, equipped with Multiple Launch Rocket Systems (MLRS), would provide indirect fires for the air attack division

wherever employed. The division support command (DISCOM), composed of aviation maintenance, ground maintenance, medical, and transportation units, would provide sustained support operations for a minimum of 7 days.



The air attack division's diverse organizational structure, as depicted in Figure 7, would provide several valuable capabilities. The heavy reliance on attack helicopters make the division a formidable force against enemy armor formations. The air attack division commander would fight and maneuver his ground maneuver and attack helicopter forces by maximizing the division's advantages of night fighting capability and precision guided munitions. The air attack division, augmented by advanced tactical

munitions (ATACMs), electronic warfare (EW), and air force support, would possess the capability to destroy enemy forces throughout the depth of the battlefield. Helicopters offer a mobility advantage over a ground maneuver opponent. The ability to capitalize on these maneuver advantages would enable the contingency force commander to rapidly seize the initiative.

Attack helicopters experience the most success when they attack the enemy's flanks or rear and engage armored vehicles moving on roads and in open terrain, especially at night. Attack helicopter operations are very complex and risky. They require accurate near real-time intelligence to ensure that the helicopters arrive at the engagement area when the targeted enemy forces are there. Digital down-links directly to individual aircraft from a Joint Service Target Acquisition System (J-STARS) provides this timely information. To protect the attack helicopters, enemy air defense artillery and other counterair capabilities must be suppressed or destroyed. The combination of near-real time intelligence and long range MLRS fire support provide an extremely effective Suppression of Enemy Air Defenses (SEAD). However, all these facets of combat must be synchronized to allow the air attack division to accomplish its mission successfully.

Like the air assault division, the air attack division's reliance on helicopters brings with it inherent vulnerabilities. Adverse weather and environmental conditions may degrade operations. The organic air assault infantry and light armor forces should reduce this vulnerability somewhat. Logistics provides a major challenge in the air attack division. The numerous helicopters in the division use inordinate amounts of aviation fuel requiring the establishment of Forward Arming and Refueling Points (FARPs). The mobility of the helicopters allow them to fly to the FARPs

alleviating the need to transport the huge amount of fuel to frontline positions as required for ground vehicles.

Two force structure issues of the air attack division deserve further explanation since they address identified limitations of the division and deviate from present doctrine. They include the assignment to the division of a MLRS equipped DIVARTY and an air assault division reinforced with two light armor battalions.

A major limitation often voiced of Army aviation include its inability to seize or hold terrain. Situations will arise in contingency operations which require key terrain to be seized or held. This type mission requires ground maneuver forces. The air assault brigade to the air attack division fulfills this mission and gives the division a 24-hour all weather capability. While not degrading the division's mobility advantage, the air assault brigade can conduct operations allowing the air attack division to seize and hold the vital terrain for short periods of time.²⁷ The air assault brigade, equipped with the antitank systems of the air assault battalions and the armored gun systems of the light armor battalions, make the air attack division a true combined arms team. When not employed in a maneuver role, the air assault brigade provides effective local security for the valuable aviation and MLRS assets. The air assault brigade greatly enhances the effectiveness of the air attack division to conduct contingency operations.

Another problem often cited about Army aviation units includes the lack of dedicated indirect fire support. Seldom does an artillery unit provide direct support fires for the aviation assets since the aviation unit does not own the terrain in which it conducts operations. Placing MLRS assets in a direct support relationship to the air attack division solves this problem.²⁸ This command relationship differs from current doctrine, however several

issues support doing so. The division artillery headquarters would provide a centralized planning headquarters for joint suppression of enemy air defenses (J-SEAD). MLRS units firing ATACMs possess the capability to range throughout most areas of operation thus negating the requirement for a complex fire support plan executed by numerous tube artillery units and enhancing the survivability of both Army and Air Force aircraft conducting combat operations. The division artillery headquarters would coordinate the fires of other artillery units required to fire localized and complementary suppression of enemy air defense systems. The division artillery would also provide deep fires on enemy formations in coordination with the Air Force assets. When not providing direct support fires for the air attack division, the MLRS units would provide general support (GS) fires for other contingency forces.

IV. Critical Analysis.

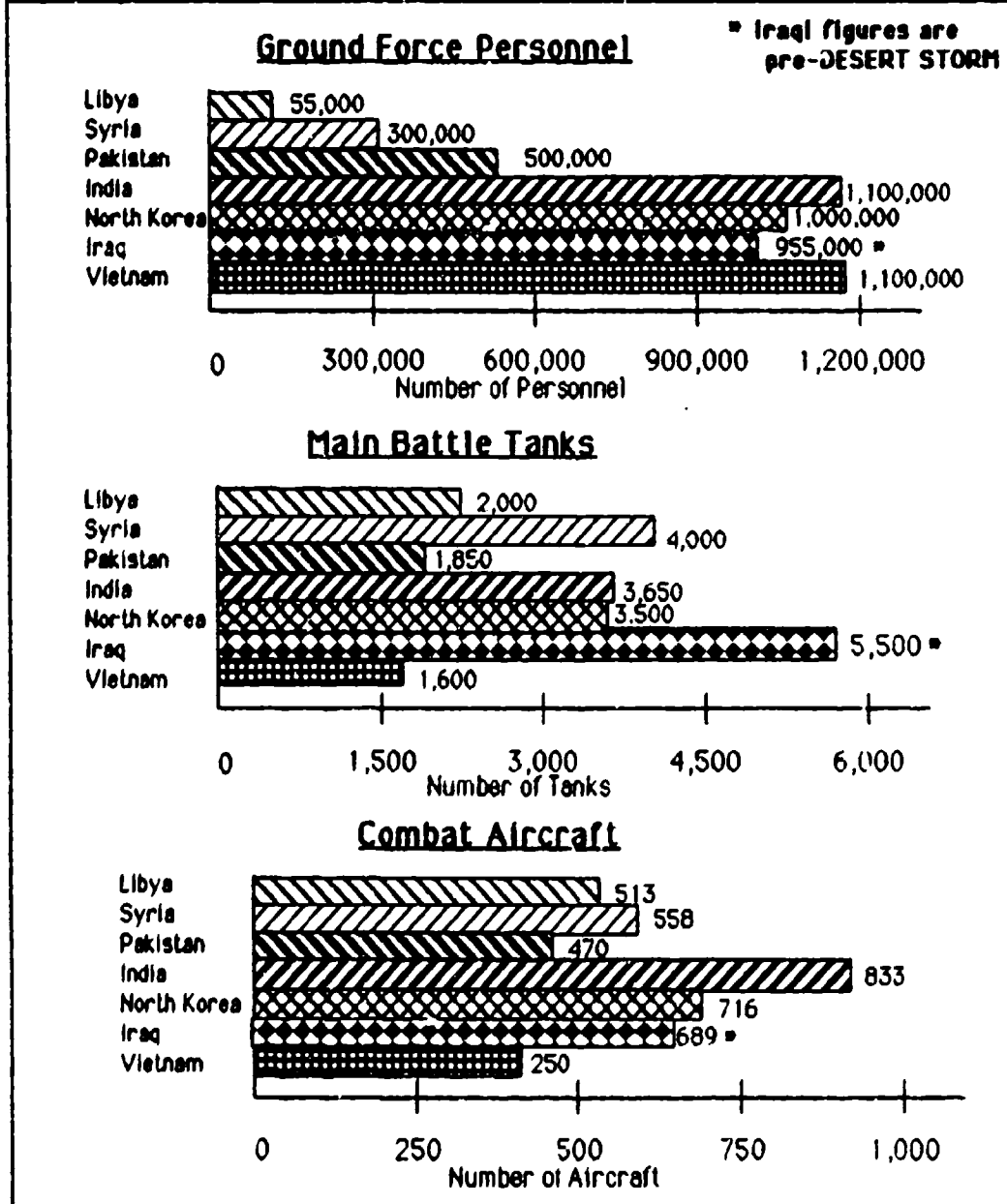
U.S. Army forces may have to rapidly respond to a variety of contingencies anywhere in the world. Conflicts may vary from low- to mid-intensity. The versatility of contingency forces presents the planners with multiple employment options. Selection of the preferred force option or combination of options resulted from careful analysis of many criteria. This study will examine four of these criteria in detail (1) threat/terrain, (2) deployability, (3) relative combat power, and (4) sustainability. A detailed analysis of the air attack division compared to the other contingency forces will determine which model is the most effective

A. Threat and Terrain Analysis.

Looking into the future and trying to project possible threats to U.S. interests presents a most difficult task. For some factors, such as demographics and terrain, information exists to support potential long-range trends. However, for most of the factors such as geopolitics and economics, potential trends are anybody's guess. The intent of the threat and terrain criterion does not to attempt to create a precise picture of the future, but tries to develop a base-line description of possible future contingency operations.

Trends in the changing world hold great potential for increased instability. Increasing numbers of precision munitions, air defense systems, combat aircraft, helicopters, mechanized and motorized systems, sophisticated signal and communications equipment, and computer technology are available to any army for the right price. In addition, chemical weapons are rapidly becoming low-cost weapons of mass destruction for poorer nations. The threat portion of the first criterion focuses just on the strength of ground forces, main battle tanks, and combat aircraft because history has shown these three facets of a country's military poses the greatest threats. Many countries which do not necessarily agree with U.S. national policy possess very capable armies that maintain capabilities well beyond their internal security requirements and could possibly threaten U.S. interests in their respective regions of the world should a difference develop between them and the U.S.²⁹ The countries identified as possible future threats all possess significant quantities of each and can threaten U.S. interests in their respective regions of the world.

Figure 8 - Selected Military Capabilities Worldwide

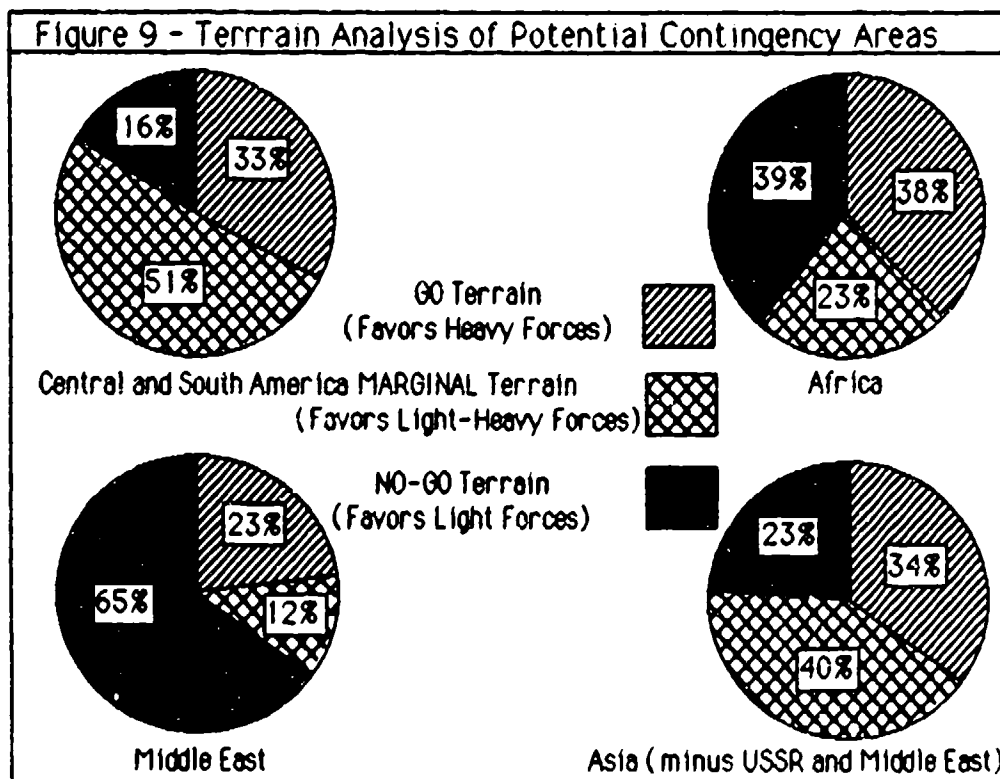


Therefore, U.S. contingency forces must be prepared to face a multitude of enemy threats as shown in the Figure 8. When considered in light of the proliferation of modern arms, the situations in the listed countries pose possible threats to U.S. interests in the future. India and Vietnam both

possess armies of over 1 million men. These armies do not have significant amounts of modern weaponry, however, they have extremely large formations of light infantry. Iraq (pre- DESERT STORM), Syria, India, and North Korea own thousands of tanks each. U.S. contingency forces will require adequate antitank capabilities to oppose these foes. India, North Korea, Iraq, and Libya have air forces of over 500 combat aircraft. Special air defense considerations exist if opposing such forces. These factors, which are just a few of the considerations in a threat analysis, should influence the kind of contingency force the U.S. Army builds.

The varying capabilities of the evaluated contingency forces aid in determining which situations they should be employed. Airborne and light infantry units are best employed against light enemy forces. Neither of these forces, unless fighting on favorable terrain with augmentation, should oppose a heavy or even light-heavy mix of enemy forces. The air assault division has the versatility to combat the entire spectrum of enemy forces. Its air assault brigades can effectively fight light enemy forces. The large number of attack helicopters make the division a viable force against a light-heavy mix or heavy enemy force. The ability to move quickly by air further enhances the air assault division's capabilities against any foe. The mechanized division's best employment is against heavy enemy forces. The vulnerabilities of the mechanized division can be easily attacked by light enemy forces. The air attack division provides an even stronger, more diverse contingency force. The formidable firepower of three attack helicopter brigades would prove decisive in most engagements against heavy enemy forces. The division also has the air assault brigade, to include the light armor battalions, to aid in fighting light enemy forces.

Terrain analysis is the second portion of the first criterion. It also will influence the kind of contingency force the U.S. Army should build. Terrain considerations must maintain a very broad perspective for contingency operations. Ports, transportation systems, natural resources, major land forms, and regional characteristics become significant in the planning and direction of contingency operations. Contingency force commanders must also perform tactical terrain analysis in light of their unit's specific mission. Figure 9 presents the variance of terrain in just a few of the potential contingency operation areas.³⁰ This study uses terrain analysis at the regional level because the identified potential threats are regional powers and possess the capability to threaten U.S. interests throughout their respective region



The key elements of terrain analysis aid the commander in determining his force mix and concept of operations. For example, contingency operations conducted in the jungles of Panama will require a completely different mix of forces and concept of operations than a contingency operation to the deserts of Saudi Arabia. While heavy forces rule in the desert, plains, steppes, tundras, or open valleys; the light infantry and airborne divisions reign supreme in jungles, forests, mountains, and cities. The light infantry and airborne divisions can be very effective in restricted terrain to maximize their lack of firepower and offset their mobility disadvantage against heavier forces. The air assault division can operate in any terrain limited only by adverse weather and environmental conditions. Terrain greatly influences a mechanized division's operations. Mechanized forces operate best in open terrain where they maximize their mobility and long range fires advantages. The air attack divisions can operate effectively in any terrain. On the expanded, nonlinear battlefield envisioned in the ALBF concept, attack helicopters provide an ideal weapons system to carry the fight to the enemy at the decisive place and time. Minefields, rivers, mountains, or jungles do not stop a helicopter. Attack helicopters, characterized by their advanced technologies and inherent mobility advantages, bring a significant capability to the battlefield. They provide the commander with a flexible and offensively postured force increasing the unit's physical and mental agility.³¹

B. Deployability.

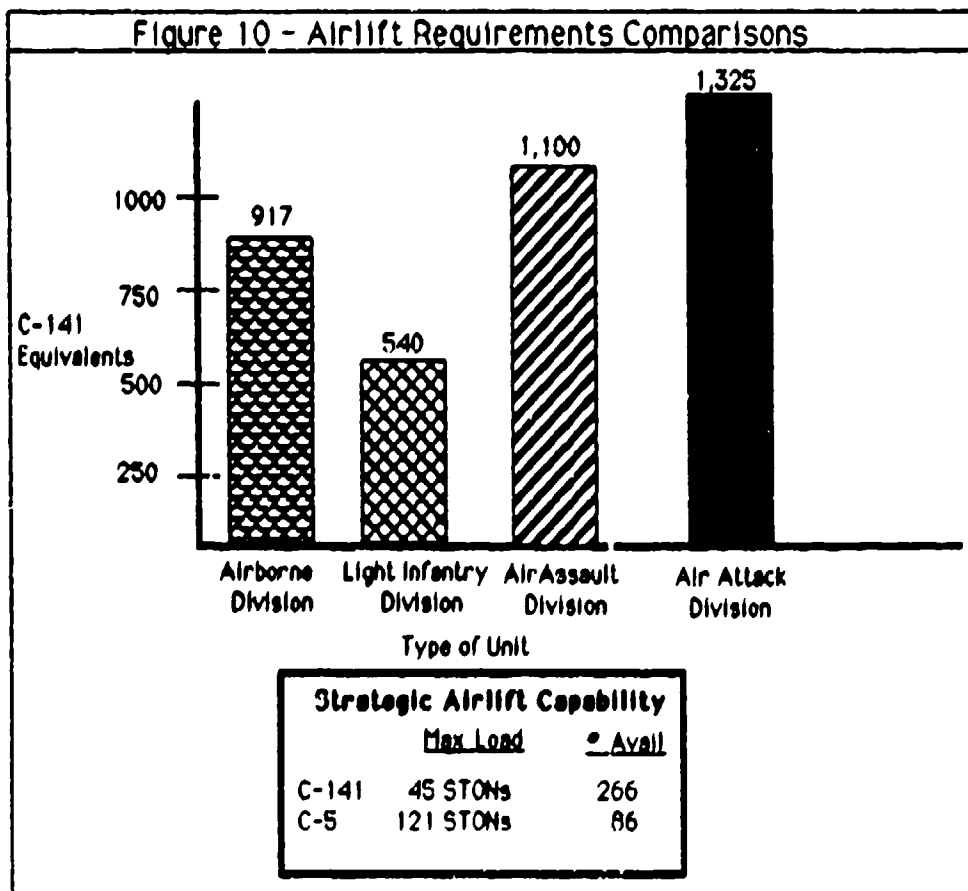
The second critical characteristic of future contingency forces focuses on deployability. The key to successful contingency operations depends on getting to the area of operations in the shortest amount of time with the most possible combat power, or as Nathaniel Bradford noted during the Civil

War, "Get there first with the most."³² The nature of U.S. interests around the world requires that the Army be globally deployable, often with little or no warning, from CONUS based locations or from forward bases. But even the most deployable and combat ready Army cannot be deployed without adequate strategic lift. One of the Army's primary concerns centers on the ability to deploy its forces. Without adequate strategic airlift and sealift, the Army cannot meet its requirements as a global contingency force. Current and anticipated strategic lift capabilities fall well short of the Army's needs to meet its mission.

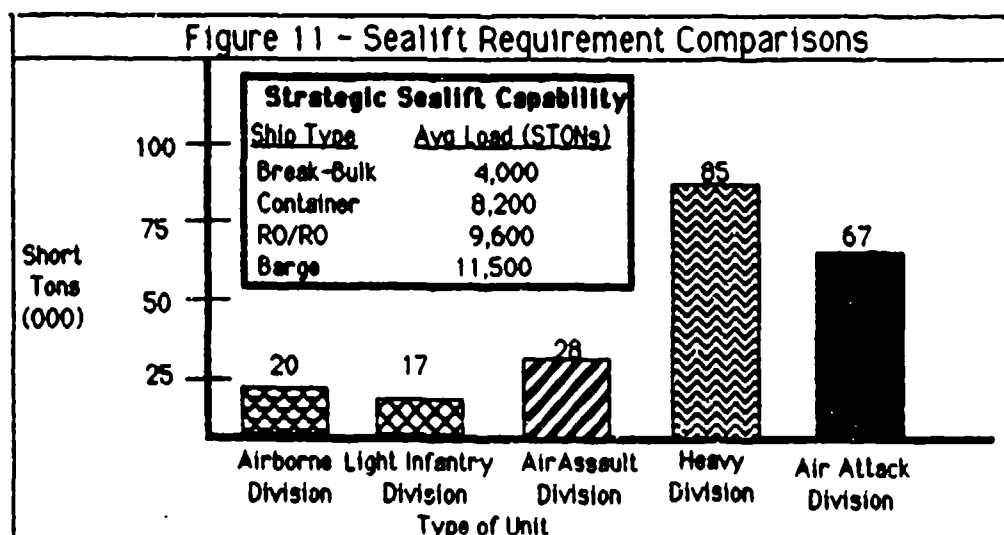
During the initial stages of contingency operations, airlift provides the Army with a rapid response capability to insert forces and provide for the immediate resupply. While using airlift for the initial stages of contingency operations, the Army relies on sealift to move the bulk of the combat power and resupply. Historical data shows that approximately 95% of the equipment and supplies moved to an objective area are transported by sealift.³³

Opinions vary as to the lift requirements to move specific types of units. JUST CAUSE and DESERT SHIELD provided invaluable exercises to validate these requirements. Figure 10 depicts a comparison of the airlift requirements to move the various types of divisions. All figures except that required to move a light infantry division and the proposed air attack division come from the actual deployment of units to Saudi Arabia during DESERT SHIELD.³⁴ The light infantry division figure resulted from the actual deployment of the entire 7th Infantry Division (Light) in August 1986 for the Light Infantry Division Certification Exercise.³⁵ The projected lift calculations for the proposed air attack division result from data provided by the Worldwide Military Command and Control System. Actual

calculations were conducted by project officers assigned to the U.S. Central Command (USCENTCOM).³⁶ The 82d Airborne Division required 917 C-141 equivalents (860 C-141 and 19 C-5 sorties) to transport the unit from home base to the objective area.³⁷ A light infantry division, whose force structure was established based on strategic mobility, deployed in approximately 540 C-141 equivalents. The 101st Airborne Division (Air Assault) needed approximately 1,100 C-141 equivalents to deploy to Saudi Arabia because of the requirement to transport large numbers of helicopters.³⁸ Air movement of a heavy division lacks feasibility and was not considered.



The U.S. possesses minimal sealift capabilities. Currently, the deployment of more than two divisions plus their sustainment requirements exceeds capabilities. Only eight SL-7 fast sealift ships are now in service. These provide an ideal means for transporting a heavy division with their 33-knot speed and roll on / roll off capability.³⁹ Figure 11 depicts a comparison of sealift requirements for contingency forces.⁴⁰



An airborne division requires only about 20,000 short tons of sealift resources to move while a light infantry division requires 17,000 short tons. An air assault division requires approximately 30% more sealift because of the bulkiness associated with moving helicopters. The weight and size of a heavy division, approximately 4,700 vehicles of all kinds and over 100 helicopters, requires the most sealift of any of the forces examined. An air attack division also requires significant sealift compared to airborne or light infantry divisions because of the large number of helicopters requiring movement.

Since the Army will have fewer forces based overseas, it must develop readily deployable forces that project power rapidly wherever U.S. interests are threatened. Whether moving by sea or air, deployability favors the airborne and light infantry divisions. They can get to an objective area in a shorter amount of time and require less strategic lift. The air assault and the air attack divisions both take significantly more strategic lift assets to deploy because of the bulkiness of the numerous aircraft assigned to each division. Technological advances in aircraft design continue to enhance the capability of self-deploying helicopters throughout the world and reducing the time required to load them aboard strategic airlift assets for movement. With the fielding of the Light Helicopter in the mid-1990's, the air assault and air attack divisions will possess increased deployability potential. The mechanized division takes the longest to deploy of any of the contingency forces. Based on a METT-T analysis, strategic mobility requirements must now balance with tactical capabilities.

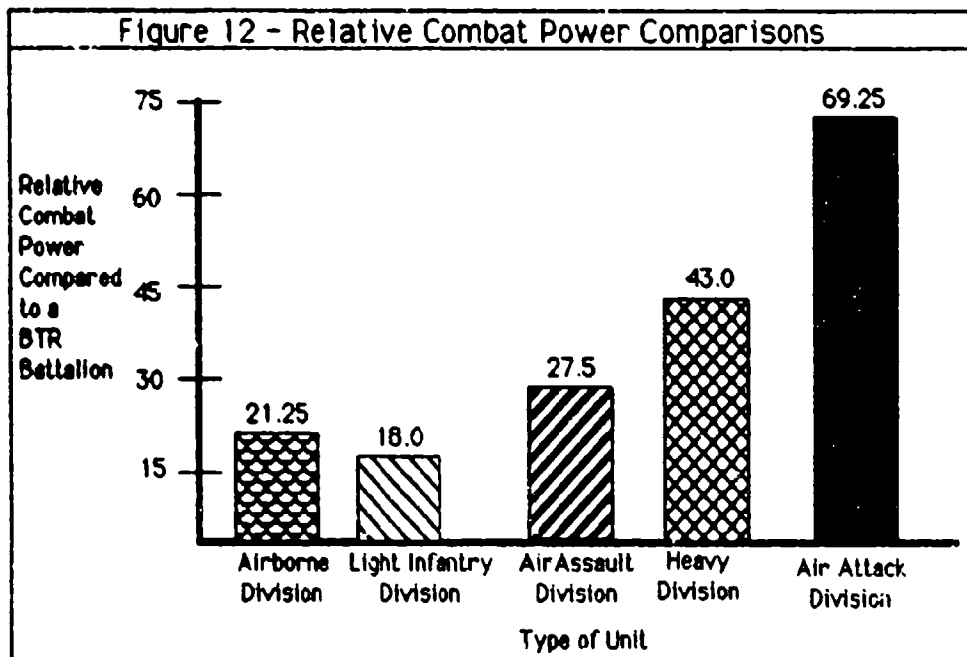
C. Combat Power.

Once a contingency force deploys to an area of operations, it must possess the combat power to deter the enemy from hostile actions, or if deterrence fails, to rapidly gain the initiative and decide the outcome of the operation. "Combat power is the ability to fight. It measures the effect created by combining maneuver, firepower, protection, and leadership in combat actions against an enemy in war."⁴¹ The generation of combat power requires the conversion of the potential of forces, resources, and tactical opportunity into actual capability through violent and coordinated action concentrated at the decisive time and place.⁴² This becomes increasingly difficult in light of the proliferation of advanced weaponry and technology throughout the world. While quantitative measures of available

capabilities remain important, the quality of available capabilities, such as leadership, are equally important. This study focuses only on the maneuver and firepower aspects of combat power because these two parts of combat power are most relevant to contingency operations..

"Maneuver is the movement of forces in relation to the enemy to secure or retain positional advantage."⁴³ Contingency forces require strategic, operational, and tactical maneuverability. Strategic mobility has already been discussed in detail in terms of deployability. Operational maneuver "attempts to gain advantage of position before battle and to exploit tactical successes to achieve operational results."⁴⁴ Light infantry and airborne divisions may possess operational mobility but they lack tactical mobility. Their organic aviation brigades can only transport a small percentage of their combat forces at one time. The divisions must receive significant ground transportation support to move even a small fraction of their units via ground transport. Because aviation assets are integrated throughout the division, the air assault division possesses good operational mobility enabling it to move considerable distances and rapidly concentrate forces at the critical time and place. However, once ground maneuver units are inserted, these elements of the air assault division lack tactical mobility. A heavy division, especially if equipped with the M1 Abrams Tank and the M2 Bradley Infantry Fighting Vehicle, possesses good operational and tactical mobility. While capable of moving rapidly throughout the area of operations, only logistic constraints and terrain limit its operations. The air attack division, like the other contingency forces, possesses great operational mobility. However, unlike all but the mechanized division, the division also has excellent tactical mobility. The air attack division can move 100% of its organic combat assets simultaneously.⁴⁵

"Firepower provides the destructive force essential to defeating the enemy's ability and will to fight."⁴⁶ Current weapons and means of massing fires make firepower devastatingly effective, accurate, and lethal. Maximum firepower against the enemy requires the coordination and synchronization of the various battlefield operating systems. An airborne division provides formidable firepower because it owns more anti-armor systems, both ground mounted and attack helicopters, and can defend effectively against a heavier force in favorable terrain. However, it must receive augmentation of medium artillery and air defense systems in any prolonged operations. A light infantry division possesses only minimum firepower and must receive significant augmentation of artillery, antitank systems, and air defense support if it opposes a heavy enemy force. The air assault division provides increased firepower as a direct result of its four organic attack helicopter battalions. The mechanized division's firepower comes from the entire facet of combined arms to include infantry, armored vehicles, artillery, and aviation. The air attack division surpasses even the mechanized division in firepower. The nine attack helicopter battalions provide a significant combat force. In addition, the three air assault battalions and two light armor battalions enhance the firepower of the division. The greatest combat multiplier comes from the four MLRS battalions. The indirect fire capabilities of these assets are critical to the success of the air attack division.



Relative combat power, as described in Student Text 100-9 The Command Estimate, is the overall relationship of the combat power of friendly forces using a BTR battalion as a base unit.⁴⁷ It aids the commander in determining what types of operations his unit is capable of performing. For example, Figure 12 depicts the relative combat power of the contingency forces being examined.⁴⁸ Relative combat power denotes only an estimate and does not consider the qualitative factors already discussed such as training and leadership.

D. Sustainability.

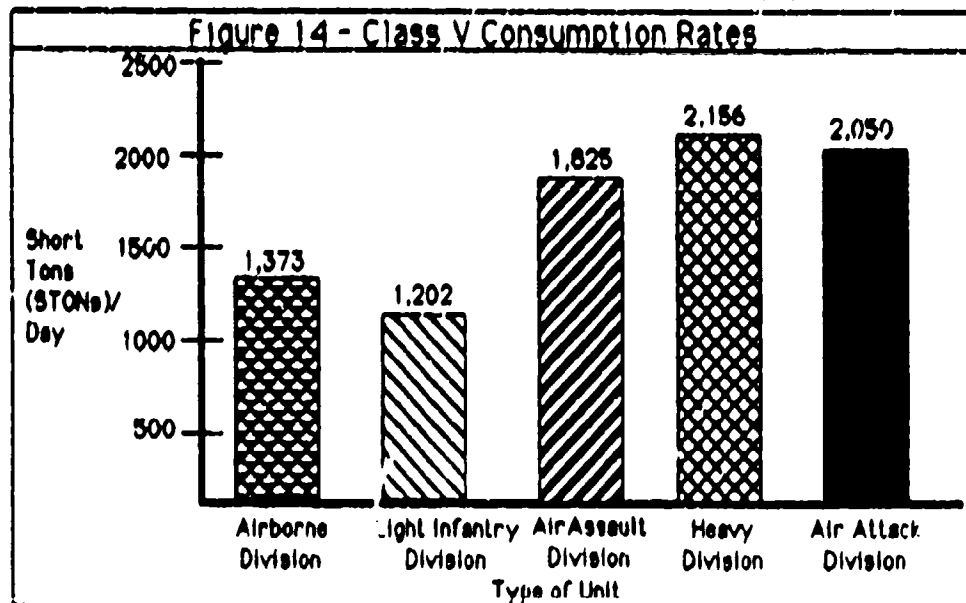
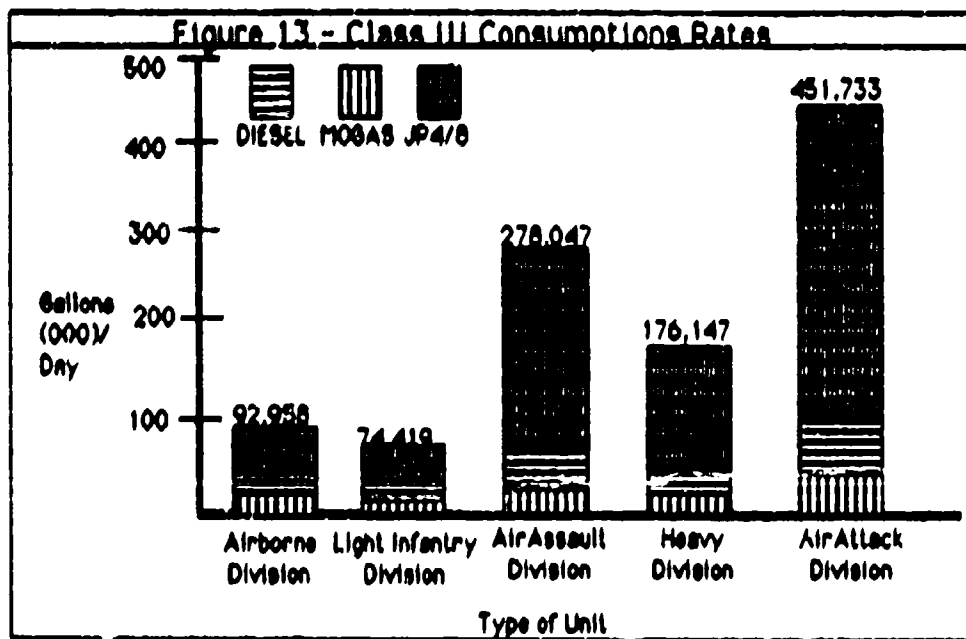
Sustaining a contingency force appears to be the ultimate logistician's nightmare. Vulnerable lines of communications, requirements for large amounts of supplies, maintenance of complex weapons systems miles from adequate facilities, and the requirement to ensure timely treatment of casualties describe but a few of the innumerable challenges of sustaining this type of operation.

The capability to sustain a contingency operation from beginning to end may likely set the tempo of the operation. Major considerations include the control, positioning, and priority of sustainment capabilities. Major lines of communications and building up logistics while protecting vital resources are key to the success of the operation. Base development decisions are among the most important planning activities made concerning the objective area and must be consistent with the contingency force commander's intent. A successful contingency operation is not possible without imaginative sustainment planning and execution.

Actual sustainment capabilities often limit an operation. In developing a plan, the commander must have reasonable confidence that the support structure can sustain the operating forces. As the operation progresses, the current requirements of combat units must constantly balance with capabilities of support units. Failure to do so may bring the operation prematurely to its culminating point. Historical examples show that three service support functions become very critical in combat, especially contingency operations.⁴⁹ First, enormous tonnages of ammunition require movement. Second, a huge volume of fuel must flow to the area for consumption by multiple sources. Third, casualties must receive initial triage care and then be evacuated to prepared medical facilities. This study focuses on the first two of these requirements because they are the most critical to successful contingency operations.

Weapons systems of modern war consume large quantities of fuel and ammunition. Given the large variety of ammunition and weapons in use and the fluidity of contingency operations, fueling and arming the force have become even greater challenges. While technologically advanced ground and air vehicles provide great mobility and firepower to our forces, they also

consume large quantities of fuel. A high volume of fuel will be needed for daily operations and this quantity will greatly increase during periods of intense combat. Arming contingency forces will become one of the largest, most time-sensitive tasks of the sustainment system. Figures 13 and 14 depict the challenges of fueling and arming such forces.⁵⁰



Airborne and light infantry divisions use comparatively little fuel and ammunition; however resupplying these forces presents a difficult task. They rely entirely upon tactical and strategic airlift for resupply until linkup with other ground forces. If this "fragile lifeline" is interdicted, the divisions can only sustain themselves for a very short period of time. A light infantry division can only operate for 72 hours without external support. This weak link of these divisions provide a vulnerability for the enemy to exploit. An air assault division requires large amounts of fuel and ammunition. It uses almost as much ammunition as a heavy division and significantly more than either an airborne or light infantry division. The division uses significantly more fuel, especially aviation fuel, than other types of unit. Organic lift helicopters greatly aid in the timely resupply of the division once the supplies arrive in the objective area. A commander must have relatively secure lines of communications to support this type of unit. Fueling and arming a mechanized division demands a well structured and efficient support system. Large amounts of fuel and ammunition are required. The fast moving nature of mechanized operations require responsive and continuous sustainment. The air attack division, much like the air assault division, also requires large amount of fuel and ammunition. It consumes more of each of these classes of supply than any of the other contingency forces examined except ammunition consumed by a heavy division. Due to the nature of some of its weapons systems, the MLRS and Armored Gun System, unique ammunition requirements exist. Logisticians must anticipate, integrate, and improvise to ensure the sustainment demands of the division are met.

Sustainability of an air attack division, while creating many challenges, actually poses fewer problems than the other contingency forces. The

division's organic lift assets possess the capability to transport 100% of the division's equipment. In addition, the organizational structure of the division eases resupply. All sustainment requirements, especially Classes III and V, can be moved rapidly by airlift to forward assembly areas. If for some reason this line of communication becomes severed temporarily, the majority of the combat assets can return autonomously to the base of supply for sustainment requirements. By carefully anticipating, integrating, and improvising sustainment requirements, commanders and logisticians in an air attack division can ensure the demands are met and that sustainment does not become the "logistician's nightmare."

V. Conclusions.

The changing global environment will impact significantly on the future role of the Army. As the Army shifts from a forward deployed focus toward a smaller, globally deployable contingency force new organizational structures are required. Advanced technologies, as displayed in DESERT STORM, will also play a key role in future operations. As General Vuono stated, the future Army must be "versatile, deployable, and lethal" to counter the myriad of capable enemies spanning the spectrum of conflict.⁵¹ The air attack division would provide a valuable independent contingency force or an integral complement to the other contingency forces and ensures the U.S. can react to the entire continuum of contingency operations. The division would provide a broader spectrum of applicability and flexibility for future strategic planners and campaign designers of contingency operations. In each future contingency operation, force mixes must be

determined relative to four criteria: (1) threat/terrain, (2) deployability, (3) relative combat power, and (4) sustainability.

The air attack division, assuming approval of the proposed force structure, can effectively operate against more types of enemy forces and in more varieties of terrain. The mix of aviation, infantry, light armor, and artillery provides a force capable of defeating guerillas or heavy armor formations, and everything between. The speed and mobility of this organization provides a marked advantage over any enemy force. The air attack division can also operate in any terrain. The preponderance of its combat power is not restricted by rivers, mountains, or obstacles. Severe weather conditions may limit some operations, however, technological advances in aircraft have greatly reduced this factor. The Light Helicopter, which will begin fielding in the mid-1990's, can operate day or night in almost any weather conditions. The capabilities of the diverse forces within the air attack division further reduces this limitation. If the weather is so severe as to restrict operations of the air attack division, it is very doubtful if any effective military operations can be mounted by either side.

The key to successful contingency operations is deployability. The air attack division can adequately deploy aboard strategic airlift assets in a timely manner. It cannot present itself as a combat force as quickly as either the airborne or light infantry divisions; however, many of the deployability limitations will be eliminated or greatly reduced in the next five to ten years with the fielding of the Light Helicopter. The air attack division provides great flexibility as it can stage at a secure location literally hundreds of miles away from the enemy, and then self-deploy into the objective area as an effective combined arms force. The division also

possesses unmatched operational and tactical mobility allowing its combat assets to mass at the decisive time and place.

The air attack division provides more relative combat power than any of the other forces examined to include the heavy mechanized division. The development of Army aviation, especially the capabilities and potential of attack helicopters, has established it as a viable means of conducting contingency operations. With the current fielding of the AH-64 Apache and the Light Helicopter on the horizon, the Army will possess some of the finest tools of war. To capitalize on this quality equipment, sound doctrine and organizational models must be developed. The integration of the aviation assets with the air assault infantry, light armor, and MLRS battalions can maximize the high speed, mobility, and firepower of all these systems to defeat the entire spectrum of enemy forces from guerillas to heavy armor formations.

The air attack division presents some great sustainment challenges. However, all of the challenges can be overcome with proper planning. While the division's technologically advanced air and ground vehicles provide unique mobility and firepower, they also consume an inordinate amount of fuel and ammunition. A significant amount of strategic airlift and sealift assets will have to be dedicated for movement of supplies into the contingency area. Once the supplies arrive in the objective area, the division's organic lift helicopters can move the supplies throughout the division's area in a timely manner. Sustainment of an air attack division will truly challenge the logisticians to meet the sustainment imperatives of anticipation, integration, continuity, responsiveness, and improvisation.⁵²

In summary, the proposed air attack division provides a broader spectrum of applicability and flexibility than the other contingency forces examined.

Its great mobility and firepower enable it to defeat any foe throughout the spectrum of conflict. Centralization of the diverse weapons systems in an air attack division under one headquarters increases combat effectiveness and eases the synchronization of maneuver. The addition of ground maneuver forces, air assault infantry and light armor, and direct support MLRS enhances the division's effectiveness when and where environmental conditions are not always favorable to aviation operations. The U.S. Army stands at the threshold of a unique opportunity to develop new concepts of future warfare and contingency operations. The air attack division capitalizing on its inherent versatility, lethality, and deployability will play an important role.

VI. Implications.

The Army should continue to study the utilization of the air attack division as an independent contingency force or as a complement to other contingency forces. Employing the air attack division enables the contingency force commander to defeat the entire spectrum of potential enemies. While this is not a conclusive study, it does correctly point out that the need exists for much more analysis and testing of this concept. Furthermore, the study also provides a start point for the discussion of future contingency operations and the role of Army aviation. Several implications concerning the air attack division were drawn from this study and deserve mention.

First, forces must be tailored to the right force mix in accordance with METT-T analysis. The myriad of potential threats and numerous environmental conditions make this extremely important. Most contingency

operations will require a combinations of the capabilities of different types of forces available as well as the support of our sister services. Only a careful METT-T analysis can determine the right mix of forces to accomplish the mission. None of the current contingency organizations appear to provide a force capable of responding to the multitude of threats expected in the future. The air attack division does provide an alternative. Commanders must carefully consider the capabilities and limitations of the air attack division when tailoring future contingency forces.

Second, commanders of future contingency operations must carefully balance strategic mobility and tactical capability. Current contingency forces are either rapidly deployable but with reduced combat power (airborne, light infantry, and air assault divisions) or else they take an extended period to deploy but arrive with significant combat power (mechanized division). The air attack division spans this gap. It can deploy in a relatively rapid manner with great combat power. With the fielding of the C-17 aircraft and the commissioning of additional SL-7 fast sealift ships, the timeliness of an air attack division to respond to a contingency worldwide will increase. New weapons systems, such as the Light Helicopter and the Armored Gun System, can deploy easily and reduce the time required to deploy the division.

Third, a concerted effort exists for responsive and flexible sustainment. Efforts to reduce sustainment requirements must gain priority. Maintenance and Class III requirements are areas where reductions can be made. Today's aircraft consume huge amounts of fuel. The fielding of the Light Helicopter will reduce some of the demands. It will provide one common airframe for attack, reconnaissance, and lift missions. If deployed aboard Air Force transport aircraft, the Light Helicopter requires virtually no reassembly and

can be combat ready in under 30 minutes.⁵³ Only twelve user-level tools are required to fix any deficiency in this aircraft making it much more maintainable.⁵⁴ Designed reliability features throughout the aircraft will ensure an increased operational readiness rate. Although exact figures do not currently exist, the Army requirement goal for the Light Helicopter demands reduced fuel consumption rates. All of these improvements are a step in the right direction, but continual progress maximizing further technological advances must be made to solve the monumental sustainment challenges.

Fourth, and probably the most difficult to accomplish, the use of the air attack division in contingency operations will require an altering of perceptions on contingency operations and Army aviation. Currently, the 82d Airborne Division is always the first force on the ground in any contingency scenario. This has been successful in the past. However, the concept has never really been challenged. If Iraq continued their attack south into Saudi Arabia in August 1990, there is little an airborne division could of done to stop them. Conversely, this would of been an ideal situation to employ an air attack division with all of its inherent mobility and lethality advantages. The decision to make such a bold change in mode of operations will require education of the highest military and civilian leaders. Furthermore, the air attack division must train extensively in contingency operations and prove to the military and civilian leadership that it is capable of the mission.

We find ourselves in rapidly changing and challenging times. The Army is moving aggressively forward to shape its own destiny. As the Army assumes its new focus on contingency operations, imaginative planning of force structures will be important. Skeptics urge great caution at making

major organizational changes, but the Army should not hesitate to make such changes if the situation dictates and the changes give U.S. Army forces any type of advantage in combat. Changing world relations and fiscal constraints within the U.S. lead the Army towards the AirLand Battle Future concept. The ALBF concept envisions forward-deployed and CONUS-based units postured for global contingency operations across the entire spectrum of conflict. The mission of the Army will be to get forces where they are needed and provide the mobility and lethality essential to success in modern maneuver warfare. This provides both a challenge and an opportunity for the Army and Army Aviation. The window of opportunity is open for the evolution of modern warfare in contingency operations. Army Aviation, especially attack helicopters, will play a more important role than ever before on the future battlefield. General John W. Foss, Commanding General of Training and Doctrine Command best described this increased role when he wrote, "Army Aviation is a key link in the evolutionary change in warfare under the AirLand Battle Future concept."⁵⁵

ENDNOTES

- 1 Carl E. Vuono, The United States Army : A Strategic Force for the 1990s and Beyond (Washington DC : HQ Department of the Army, January 1990), p. 10.
- 2 AirLand Battle Future Umbrella Concept (Fort Leavenworth, KS : U.S. Army Combined Arms Combat Developments Activity, 1 June 1990), p. 12.
- 3 Ibid, p. 15.
- 4 Ibid, p. 16.
- 5 AirLand Battle Future : Alternate Base Case Study (Phase 1) (Fort Leavenworth, KS: U.S. Army Combined Arms Combat Developments Activity, 26 February 1990), p. 1-2.
- 6 Field Manual 100-15, Corps Operations, (Washington DC : HQ Department of the Army, 13 September 1989), p. 8-0.
- 7 Carl E. Vuono, Army Greenbook (Alexandria, VA : Association of the United States Army, October 1987), p. 49.
- 8 Evolution of the Army Using Insights from: AirLand Battle Future (Fort Leavenworth, KS: U.S. Army Combined Arms Center, 11 September 1990), p. 13.
- 9 Field Manual 71-100, Division Operations, (Washington DC : HQ Department of the Army, 16 June 1990), p. D-4.
- 10 Ibid.
- 11 Forces/Capabilities Handbook, (Carlisle Barracks, PA : U.S. Army War College, 21 September 1988), p. 2-21.
- 12 Ibid, p. 2-20.
- 13 Ibid.
- 14 Ibid.
- 15 Field Manual 71-100, Division Operations, p. D-3.

16 Ibid.

17 Ibid, p. D-10.

18 Forces/Capabilities Handbook, p. 2-22.

19 Field Manual 71-100, Division Operations, p. D-11.

20 Ibid, p. C-1.

21 Forces/Capabilities Handbook, p. 2-26.

22 Field Manual 71-100, Division Operations, p. C-2.

23 Forces/Capabilities Handbook, p. 7-6.

24 Airland Battle Future: Alternate Case Study (Phase 1) (Fort Leavenworth, KS: U.S. Army Combined Arms Combat Developments Activity, 26 February 1990), p. 22.

25 The Air Attack Division was first proposed in September 1990 by the U.S. Army Aviation Center, Concepts Development Branch, Fort Rucker, AL.

26 Ibid.

27 This concept is not in accordance with current doctrine; however, most of the ALBF writers approve of the idea. The Aviation School endorses the concept and the Infantry School is continuing to study the concept. At a recent ALBF GOWS General Foss stated that his only concern with such a concept was that he did not want the mobility of the aviation division tied to an infantry brigade. The aviation division has enough organic resources to move the brigade so that does not appear to be a major problem. A key point of this concept that shouldn't be overlooked is the security this brigade would provide to the aviation and MLRS assets. This concept also provides a self-contained reaction force.

28 This concept is not in accordance with current doctrine for use of MLRS. The Field Artillery School opposes this concept while the Aviation School endorses it. It has been discussed at the ALBF General Officer Workshops (GOWS) at Fort Leavenworth. The ALBF writers are split in their support for the idea. I support the concept because of the need for responsive SEAD as well as fires in the engagement areas which are well beyond the range of tube artillery.

- 29 The Military Balance, 1990-91, (London : Brassey's Publisher's for the International Institute of Strategic Studies, 1990), p. 105, 111, 118, 160, 166, 172, and 180.
- 30 Gerard Challand and Jean-Pierre Razeau, A Strategic Atlas: Comparative Geopolitics of the World's Powers, (New York, NY : Harper and Rower Publishers, 1985), p. 170.
- 31 Rudolph Ostovich III, "Army Aviation : Lethal, Versatile, Deployable", Army (Alexandria, VA : Association of the United States Army, August 1990), p. 23.
- 32 Carl E. Vuono, "The U.S. Army in the 1990s", Army Greenbook 1990-91 (Alexandria, VA: Association of the U.S. Army, October 1990), p. 26.
- 33 Michael P.W. Stone and Carl E. Vuono, Trained and Ready in An Era of Change : The Posture of the United States Army in Fiscal Year 1991 (Washington DC : HQ Department of the Army, 1990), p. VI-9.
- 34 Glenn K. Otis, "Our Deployment into the Persian Gulf - Three Views", Army (Alexandria, VA: Association of the U.S. Army, November 1990), p. 12.
- 35 Edwin H. Burba Jr., "Gulf Crisis Demonstrates the Need for Contingency Force Versatility", Army Greenbook 1990-91 (Alexandria, VA: Association of the U.S. Army, October 1990), p. 52.
- 36 This information reference WWMCCS and the deployment requirements for an air attack division based on calculations conducted by Major James Bulger, CENTCOM Staff.
- 37 Otis, p. 11.
- 38 Ibid, p. 12.
- 39 Otis, p. 12.
- 40 Ibid, p. 13.
- 41 Field Manual 100-5, Operations, (Washington DC : HQ Department of the Army, 5 May 1986), p. 11.
- 42 Ibid, p. 12.
- 43 Ibid.

44 Ibid.

45 This statement based on the proposed Table of Organization and Equipment of the Air Attack Division. The Air Attack Division was first proposed in September 1990 by the U.S. Army Aviation Center, Concepts Development Branch, Fort Rucker, AL.

46 Ibid.

47 Student Text 100-9, Command Estimate (Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1 July 1989), p. 3-3.

48 Computation of relative combat power. Numerical figures for computations were derived from Student Text 100-9, Command Estimate (Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1 July 1989), p. 3-3.

Light Infantry Division

Infantry Bn (9) x 1.0 = 9.0

Div Cav Sqdn (1) x 1.5 = 1.5

Atk Hel Bn AH-1 (1) x 3.0 = 3.0

FA Bn 105mm (3) x 1.5 = 4.5

TOTAL REL CBT PWR = 18.0

Airborne Division

Infantry Bn (9) x 1.25 = 11.25

Div Cav Sqdn (1) x 1.5 = 1.5

Atk Hel Bn AH-64 (1) x 4.0 = 4.0

FA Bn 105mm (3) x 1.5 = 4.5

TOTAL REL CBT PWR = 21.25

Air Assault Division

Infantry Bn (9) x 1.25 = 11.25

Div Cav Sqdn (1) x 1.5 = 1.5

Atk Hel Bn AH-64 (4) x 4.0 = 16.0

FA Bn 105mm (3) x 1.5 = 4.5

TOTAL REL CBT PWR = 33.25

Mechanized Division

M2 Bn (5) x 2.0 = 10.0

M1A1 Bn (5) x 3.0 = 15.0

Div Cav Sqdn (1) x 2.0 = 2.0

Atk Hel Bn AH-64 (2) x 4.0 = 8.0

FA Bn 105mm (3) x 1.5 = 4.5

MLRS Btry (1) x 2.0 = 2.0

TOTAL REL CBT PWR = 43.0

Air Attack Division

Infantry Bn (3) x 1.25 = 3.75

Light Armor Bn (2) x 2.0 = 4.0

Div Cav Sqdn (1) x 1.5 = 1.5

Atk Hel Bn AH-64 (9) x 4.0 = 36.0

MLRS Btry (12) x 2.0 = 24.0

TOTAL REL CBT PWR = 69.25

49 John A. Adams, "Balancing Strategic Mobility and Tactical Capability", Military Review (Fort Leavenworth, KS: U.S. Army Combined Arms Center, August 1988), p. 16.

50 Field Manual 101-10-1/2, Staff Officers' Field Manual Organizational, Technical, and Logistical Data Planning Factors (Volume 2), (Washington DC: HQ Department of the Army, 7 October 1987). For Class III requirements: Table 2-15 Class III Bulk Planning Factors, p. 2-54 and for Class V requirements: Table 2-16 Ammunition per Type Unit per Weapon per Day Expressed in Rounds and STON, p. 2-129. Standard usage profiles.

Light Infantry Division

CLASS III (p. 2-85)

$$\begin{aligned}\text{MOGAS} &= 412.7(12) + 255.2(12) + 4.0(12) + 266.1(12) + 6.0(12) + 55.1(100) = \\ &= 4,952.4 + 3,062.4 + 48.0 + 3,193.2 + 72.0 + 5,510.0 = \\ &= \underline{16,838.0 \text{ gal}}\end{aligned}$$

$$\begin{aligned}\text{DIESEL} &= 99.2(12) + 73.6(12) + 201.9(12) + 79.0(12) + 106.1(100) = \\ &= 1,190.4 + 883.2 + 2,422.8 + 948.0 + 10,610 = \\ &= \underline{16,054.4 \text{ gal}}\end{aligned}$$

$$\text{JP4/8} = 10,381.7(4) = \underline{41,526.8 \text{ gal}}$$

$$\text{TOTAL FUEL} = \underline{74,419.2 \text{ gal}}$$

CLASS V (p. 2-131)

$$\text{TOTAL AMMO} = \underline{1,202 \text{ STONs}}$$

Airborne Division

CLASS III (p. 2-77)

$$\begin{aligned}\text{MOGAS} &= 665.2(12) + 267.4(12) + 0.7(12) + 348.8(12) + 78.1(100) = \\ &= 7,982.4 + 3,208.8 + 8.4 + 4,185.6 + 7,810.0 = \\ &= \underline{23,195.2 \text{ gal}}\end{aligned}$$

$$\begin{aligned}\text{DIESEL} &= 120.0(12) + 138.1(12) + 247.6(12) + 99.0(12) + 142.0(100) + 0.3(12) = \\ &= 1,440.0 + 1,657.2 + 2,971.2 + 1,188.0 + 14,200.0 + 3.6 = \\ &= \underline{21,460.0 \text{ gal}}\end{aligned}$$

$$\text{JP4/8} = 12,075.7(4) = \underline{48,302.8 \text{ gal}}$$

$$\text{TOTAL FUEL} = \underline{92,958 \text{ gal}}$$

CLASS V (p. 2-131)

TOTAL AMMO = 1,373.1 STONS

Air Assault Division

CLASS III (p. 2-54 and 2-82)

MOGAS = 751.7(12) + 508.6(12) + 6(12) + 529.3(12) + 12.9(12) + 76.9(100) + 15.6(12)
9,020.4 + 6,103.2 + 72.0 + 6,351.6 + 154.8 + 7,690.0 + 187.2
29,579.2 gal

DIESEL = 239.9(12) + 204.9(12) + 359.3(12) + 92.0(12) + 266.2(100) + 0.3(12) =
= 2,878.8 + 2,458.8 + 4,311.6 + 1,104.0 + 26,620.0 + 3.6 =
37,376.8 gal

JP4/8 = 52,772.9(4) = 211,091.6 gal

TOTAL FUEL = 278,047.6 gal

CLASS V (p. 2-132)

TOTAL AMMO = 1,825.1 STONS

Mechanized Division

CLASS III (p. 2-73)

MOGAS = 40.0(12) + 4.5(12) + 675.3(12) + 579.1(12) + 4.0(12) + 623.6(12) + 2.1(15) =
480.0 + 54.0 + 8,103.6 + 6,949.2 + 48.0 + 7,483.2 + 25.2 =
23,143.2 gal

DIESEL = 72.0(12) + 279.1(12) + 280.4(12) + 160.6(12) + 198.8(12) + 551.1(3.8) +
4,689.7(5.6) + 4,666.4(5.1) + 289.3(100) + 30.0(12) =
= 864.0 + 3,349.2 + 3,364.8 + 1,927.2 + 2,385.6 + 2,094.2 +
26,262.3 + 23,798.6 + 28,930.0 + 360.0 =
93,335.9 gal

JP4/8 = 14,916.4(4) = 59,665.6 gal

TOTAL FUEL = 176,144.7.6 gal

CLASS V (p. 2-131)

TOTAL AMMO = 2,156.8 STONS

Air Attack Division

CLASS III (p. 2-73) (calculations based on cumulative consumption rates of the individual subordinate units)

MOGAS=33,131.2 gal

DIESEL=129,309.5gal

JP4/8=289, 293.2gal

TOTAL FUEL =451,733gal

CLASS V (p. 2-131)

TOTAL AMMO = 2,050 STONS

51 Vuono, The United States Army: A Strategic Force for the 1990s and Beyond, p. 10.

52 Field Manual 100-5, Operations, pp. 62-63.

53 "Why America Wins with the First Team LH. The Facts in Black and White", Army (Alexandria, VA: Association of the U.S. Army, February 1991), p. 30.

54 Ibid.

55 John W. Foss, "Challenges and Opportunities", Army Aviation (Fort Rucker, AL: U.S. Army Aviation Center, 31 July 1990), p. 6.

BIBLIOGRAPHY

MANUALS

- Field Manual 1-100. Army Aviation in Combat Operations. Washington DC: HQ Department of the Army, 1989.
- Field Manual 1-111. The Aviation Brigade. Washington DC: HQ Department of the Army, 1985.
- Field Manual 1-112. The Attack Helicopter Battalion. Washington DC: HQ Department of the Army, 1986.
- Field Manual 71-100. Division Operations. Washington DC: HQ Department of the Army, 15 November 1988.
- Field Manual 100-5. Operations. Washington D.C.: HQ Department of the Army, 5 May 1986.
- Field Manual 100-15. Corps Operations. Washington DC: HQ Department of the Army, 15 November 1988.
- Field Manual 101-5. Staff Organizations and Operations. Washington DC: HQ Department of the Army, 25 May 1984.
- Field Manual 101-5-1. Operational Terms and Graphics. Washington DC: HQ Department of the Army, 1986.
- Field Manual 101-10-1/2. Staff Officers' Field Manual Organizational, Technical, and Logistical Data Planning Factors (Volume 2). Washington DC: HQ Department of the Army, 7 October 1987.
- Forces/Capabilities Handbook. Carlisle Barracks, PA : U.S. Army War College, 21 September 1988.
- Student Text 100-3. Battle Book. Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1989.
- Student Text 100-9. The Command Estimate. Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1988.

Student Text 101-6. G4 Battle Book. Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1988.

BOOKS

Bellamy, Chris. The Future of Land Warfare. New York, NY: St. Martin's Press, 1987.

Challand, Gerard and Jean-Pierre Razeau. A Strategic Atlas: Comparative Geopolitics of the World's Powers. New York, NY : Harper and Row Publishers, 1985).

Cohen, Elliot A. and Gooch, John. Military Misfortunes: The Anatomy of Failure in War. New York, NY: The Free Press, 1990.

Cordesman, Anthony H. The Iran-Iraq War and Western Security 1984-87: Strategic Implications and Policy Options. New York, NY : Jane's Publishing, Inc., 1987.

Fuller, J.F.C. Armored Warfare. Harrisburg, PA: The Telegraph Press, 1943.

Liddell Hart, Basil H. Strategy. New York, NY: Praeger Publishers, 1967.

The Military Balance, 1990-91. London : Brassey's Publisher's for the International Institute of Strategic Studies, 1990.

Pelletiere, Stephen C., Douglas V. Johnson II, and Lelf R. Rosenberger. Iraqi Power and U.S. Security in the Middle East. Carlisle Barracks, PA: U.S. Army War College, 1990.

Romjue, John J. "From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982." TRADOC Historical Monograph Series, ed. Henry O. Malone, Jr. Fort Monroe, VA: Training and Doctrine Command, June 1984.

Simpkin, Richard E. Antitank : An Airmechanized Response to Armored Threats in the 90's. Oxford: Brassey's Publishers, Ltd., 1982

_____. Race to the Swift: Thoughts on Twenty-First Century Warfare. London: Brassey's Defense Publishers, 1985.

_____ Tank Warfare. New York, NY: Crane Russak and Co., Inc., 1979.

Stone, Michael P.W. and Carl E. Vuono. Trained and Ready in An Era of Change: The Posture of the United States Army in Fiscal Year 1991. Washington DC : HQ Department of the Army, 1990.

Tukhachevskiy, Mikhail. "New Problem in Warfare". U.S. Army War College Art of War Colloquium: Soviet Operational Concepts by Various Soviet Authors. Carlisle Barracks, PA: U.S. Army War College, 1983.

Vuono Carl E. The United States Army : A Strategic Force for the 1990s and Beyond. Washington DC : HQ Department of the Army, January 1990.

ARTICLES

Adams, John A. "Balancing Strategic Mobility and Tactical Capability", Military Review (August 1988), 16.

Barbara, James C. and Robert F. Brown. "Deep Thrust on the Extended Battlefield." Military Review, (October 1982), 21-32.

Brown, Frederic J. "Attack Helicopter Operations on the Heavy Battlefield." U.S. Army Aviation Digest, (July 1985), 2-11

_____ "AirLand Battle Future: The Other Side of the Coin." Military Review, (February 1991), 13-24.

Burba, Edwin H. Jr. "Gulf Crisis Demonstrates the Need for Contingency Force Versatility." Army Greenbook 1990-91 (October 1990), 52.

Conver, Stephen K. "Fielding a Light Helicopter is Vital to Future Army " Army, (August 1990), 26-38.

Foss, John W. "Challenges and Opportunities." Army Aviation, (31 July 1990), 6-10 and 78.

Harvey, Gary L. and David R. King. "Evolving the Army of the 21st Century " Military Review, (August 1988), 2-8.

Howze, Hamilton H. "The Howze Board, Part III: Winding Up a Great Show." Army, (April 1974), 18-24.

Ostovich, Rudolph III. "Army Aviation : Lethal, Versatile, Deployable." Army (August 1990), 20-24.

_____. "Part I: Dramatic Changes Emerging in Aviation Doctrine." U.S. Army Aviation Digest, (November 1986), 3-9.

_____. "Army Aviation in AirLand Battle Future." Military Review (February 1991), 30-37.

Otis, Glenn K. "Our Deployment into the Persian Gulf - Three Views." Army (November 1990), 12.

Parker, Ellis D. "The Challenge of Winning." U.S. Army Aviation Digest, (September 1985), 2-9.

Rippe, Stephen T. "An Army and Air Force Issue: Principles and Procedures for AirLand Warfare." Air University Review, (May-June 1986), 60-69.

Rose, John P., John E. Peters, and Michael A. Pandolfo. "What Will the Army Look Like in 2010." Army, (July 1988), 18-24.

Saint Crosbie E. and Walter H. Yates Jr. "Attack Helicopter Operations in the AirLand Battle: Close Operations." Military Review, (June 1988), 2-15

_____. "Attack Helicopter Operations in AirLand Battle: Deep Operations." Military Review, (July 1988), 2-9.

Senger und Etterlin, F.M. von. "The Air-Mobile Divisions: Operational Reserves for NATO." RUSI Journal, (1 March 1987), 23-30.

_____. "New Operational Dimensions." RUSI Journal, (2 June 1983), 11-15.

Silvasy, Stephen Jr. "AirLand Battle Future. The Tactical Battlefield." Military Review, (February 1991), 2-12

Simpkin, Richard E. "Flying Tanks? --A Tactical Analysis of the 'Main Battle Air Vehicle'." Military Technology, (August 1984), 62-80.

_____. "Airmechanized Forces of the 90's." Armor, (July-August 1981), 54-57.

Starry, Donn A. "Extending the Battlefield." Military Review, (March 1981), 24-41.

Vuono, Carl E. "The U.S. Army in the 1990s." Army Greenbook 1990-91 (October 1990), 26.

MANUSCRIPTS

Bendyk, John C. "Detailed Planning Consideration for Divisional Attack Helicopters in the Division Deep Battle: A Defensive Operation Perspective." Fort Leavenworth, KS: MMAS Thesis, 1989.

Crawford, Darrell E. "Airmechanization: Determining Its Tactical Viability on the AirLand Battlefield." Fort Leavenworth, KS: AMSP Monograph, 1989.

Hood, Carlton L. "Determining the Optimum Aviation Organization for the Operational Level of War." Fort Leavenworth, KS: MMAS Thesis, 1984.

Hussain, Farooq, Ian Kempf, and Philip McCarty. "The Future of the Military Helicopter." London: Whitehall Papers, RUSI for Defense Studies, 1986.

Keller, Robert L. AirLand Battle Future White Paper (Draft). Fort Leavenworth, KS: U.S. Army Combined Arms Combat Developments Activity, 5 February 1990.

Mowery, James L. "The Division Aviation Brigade: Operational or Tactical?" Fort Leavenworth, KS: AOSF Monograph, 4 May 1987.

Packett, Virgil L. II. "Airmechanization: The Direction and Dynamics of Army Aviation from a Combined Arms Perspective." Fort Leavenworth, KS: MMAS Thesis, 1985.

Simmons, James E. "Army Aviation: Does It Provide an Answer to Operational Maneuver in the Central Region?" Fort Leavenworth, KS: AMSP Monograph, 1990.

Sinnreich, Richard H., et al. "Employment of Combat Aviation." Fort Leavenworth, KS: SAMS White Paper, April 1986.

INTERVIEWS

Greene, COL Thomas R. Chief, Combat Developments Branch, U.S. Army Aviation School, Fort Rucker, AL. Interview conducted at Fort Leavenworth, KS on 7 August 1990.

Yates, BG Walter. Assistant Division Commander, 3rd Armored Division. Interview conducted at Fort Leavenworth, KS on 24 August 1990.

OTHER SOURCES

AirLand Battle Future Alternate Case Study : Phase I. Fort Leavenworth, KS: U.S. Army Combined Arms Combat Developments Activity, 26 February 1990.

AirLand Battle Future Alternate Case Study : Phase II. Fort Leavenworth, KS: U.S. Army Combined Arms Combat Developments Activity, 30 March 1990.

AirLand Battle Future Alternate Case Study : Phase III. Fort Leavenworth, KS: U.S. Army Combined Arms Combat Developments Activity, 19 April 1990.

AirLand Battle Future Alternate Case Study : Phase IV. Fort Leavenworth, KS: U.S. Army Combined Arms Combat Developments Activity, 4 June 1990.

AirLand Battle Future Alternate Case Study : Phase V. Fort Leavenworth, KS: U.S. Army Combined Arms Combat Developments Activity, 18 June 1990.

AirLand Battle Future Concept - Southwest Asia Scenario. Fort Leavenworth, KS: U.S. Army Combined Arms Combat Developments Activity, 2 July 1990.

Aviation White Paper: How Army Aviation Contributes to AirLand Battle Future Warfighting Concept. Fort Rucker, AL: U.S. Army Aviation Center, 2 May 1990.

Evolution of the Army Using Insights from: AirLand Battle Future. Fort Leavenworth, KS: U.S. Army Combined Arms Center, 11 September 1990.

Powell, Colin L. Statement before the Senate Committee on Armed Services on "DESERT SHIELD", 10 Sep 90.